NOVEMBER 1976
No. 11

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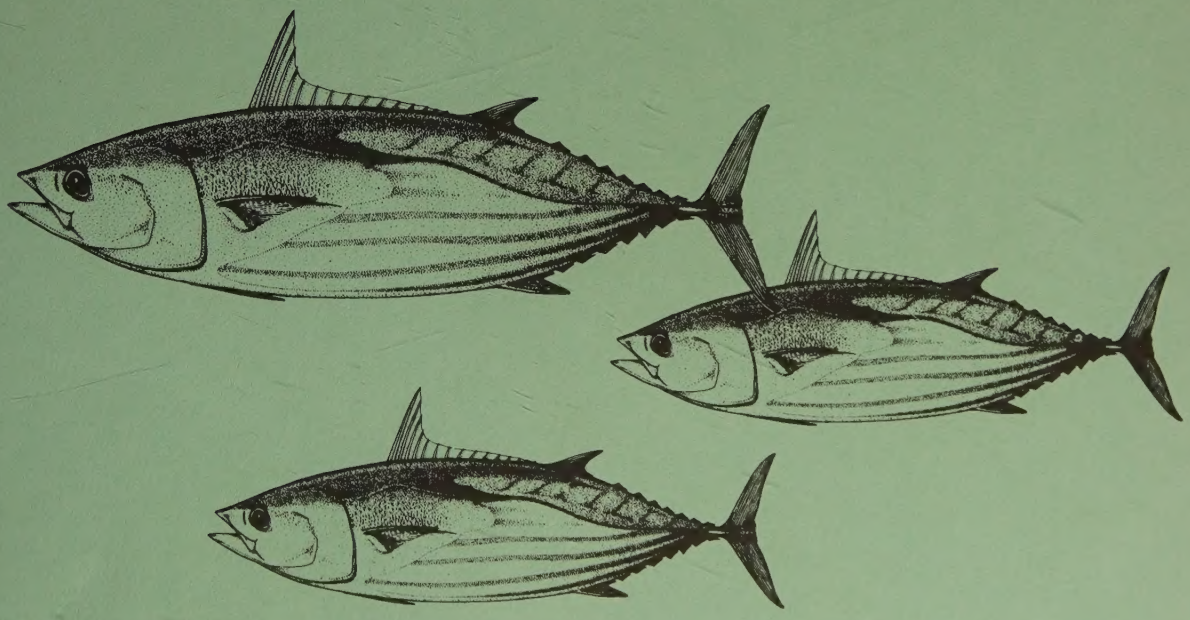
Southwest Fisheries Center-La Jolla, California



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FISHING INFORMATION

NOVEMBER 1976 , No.11

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PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) charts of winds and pressures for the eastern North Pacific, 4) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 5) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

The secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department.

Submitted for publication - December 22, 1976

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ENVIRONMENTAL CHARTS ANALYZED BY:

F. Miller (Figures 8 and 9)
J. Renner (Figures 1, 2, 3, 4, 5, 6, 7, 10 and 15 day Supplement)

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Expendable bathythermograph and salinity observations are made by the mates and engineers of the *Hawaiian Queen* of the Matson Navigation Co. The data are processed under supervision of D. R. McLain at the NMFS Pacific Environmental Group, using computer facilities of the Fleet Numerical Weather Central, Monterey. The project is partially supported by the National Science Foundation and the Office of Naval Research.

Due to budget restrictions only the San Francisco - Honolulu sections will appear regularly in the future. At certain times sections between Honolulu and other U.S. west coat ports will appear as available.

Sea Surface Temperature and Environmental Conditions

Forrest R. Miller

Eastern North Pacific

Seasonal cooling progressed at a slower rate than normal over most of the eastern north Pacific. In the Central part of the North Pacific colder than normal sea surface temperatures (SST) of 2°F (1.1°C) or more (Figure 5) were less extensive than in October. In October a very deep and persistent low pressure system formed over the North Pacific at about 170°W and in November moved eastward to a position near 160°W. This low pressure system caused rough seas and strong winds and below normal SST's along its boundaries between 35°N and 45°N. The areas covered by negative SST anomalies east of 160°W were diminished somewhat in November and spread southeastward in association with the eastward shift of the low center. Ahead of the frontal activity, which moved east and intensified in the Aleutian low, and west of a persistent high pressure ridge extending southwestward from the northwest coast of the U.S. (Figure 2), southerly winds and seas moved warmer surface water and air from southern latitudes into the northeast Pacific east of 140°W. Consequently, the area covered by above normal SST's (Figure 5) expanded westward and northward during November. The SST difference between November 1975 and November 1976 (Figure 7) showed an unusually large area off the U.S. west coast covered by positive anomalies greater than 4°F (2.2°C). This large warm year-to-year variation extended southward along the coast of Baja California and westward into the subtropics south of 20°N.

The subtropical Pacific high pressure center which normally lies along 30°N near 145°W was displaced east and north of its normal position during both October and November 1976 (Figure 2). The light winds and clear skies south of 45°N and east of 140°W combined with southerly surface winds and seas the past two months gradually lead to a north and westward expansion of above normal SST's. The SST anomaly patterns in October and November 1976 were almost complete reversals of the SST anomaly patterns in the same months of 1975. Thus, stronger than normal east-west SST gradients developed between 130°W and 150°W north of 40°N from October through November.

Western North Pacific

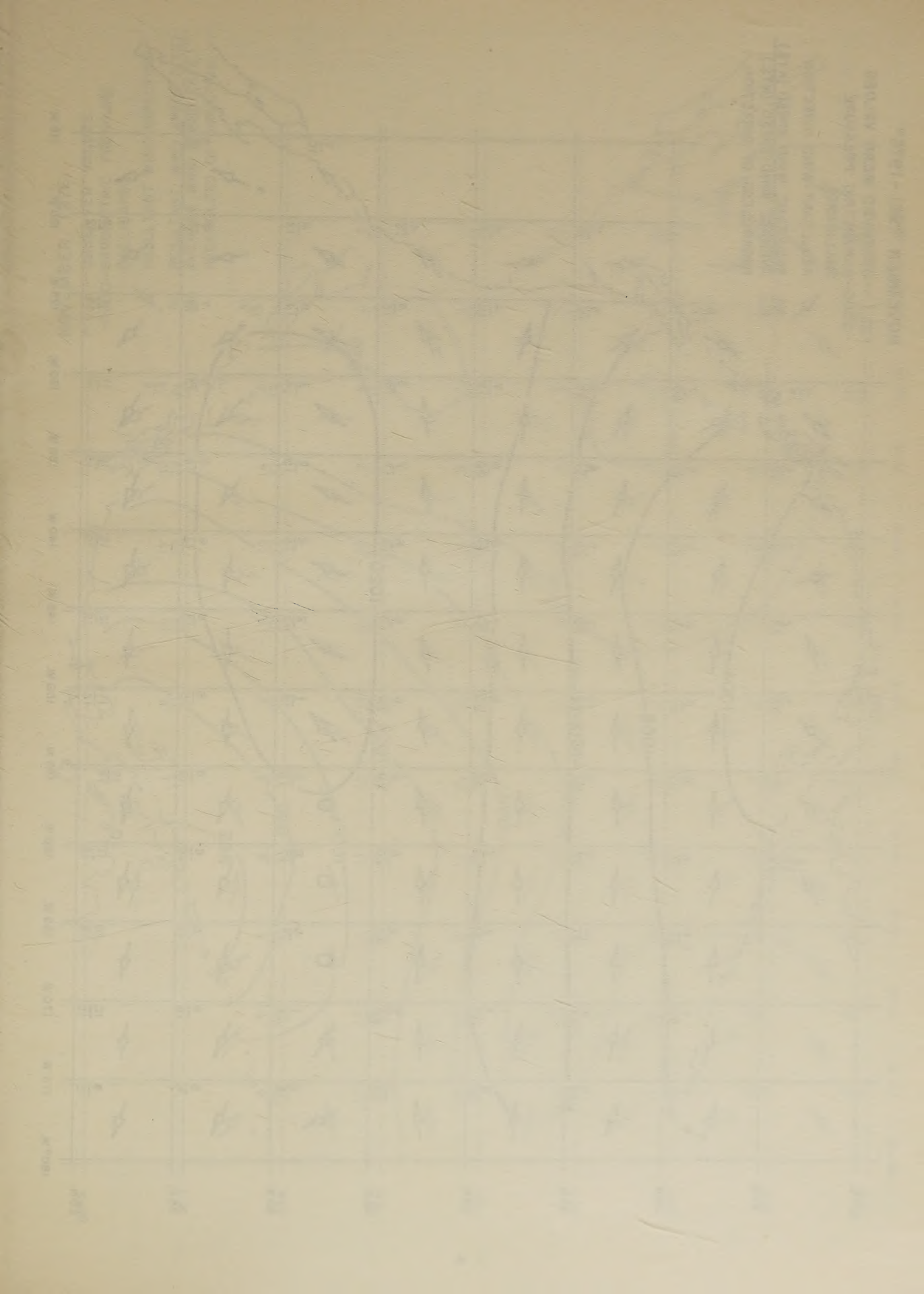
The Aleutian low pressure system centered near 55°N, 160°W in November extended westward toward northern Japan. This deeper-than-normal Aleutian low dominated weather conditions across the entire western Pacific north of 35°N during the entire month. High seas and strong winds along the periphery of the Aleutian low resulted in SST's up to 2 to 4°F (1.1 to 2.2°C) below normal (Figure 6). As the Aleutian low center moved slowly eastward in November, the areas covered by negative SST anomalies began to decrease. To the south of 35°N there was very little change in SST's apart from the expected seasonal cooling. Near 27°N between 160°E and 175°E the western subtropical high pressure center expanded and warming took place under lighter winds and clearer skies than is normal for that region.

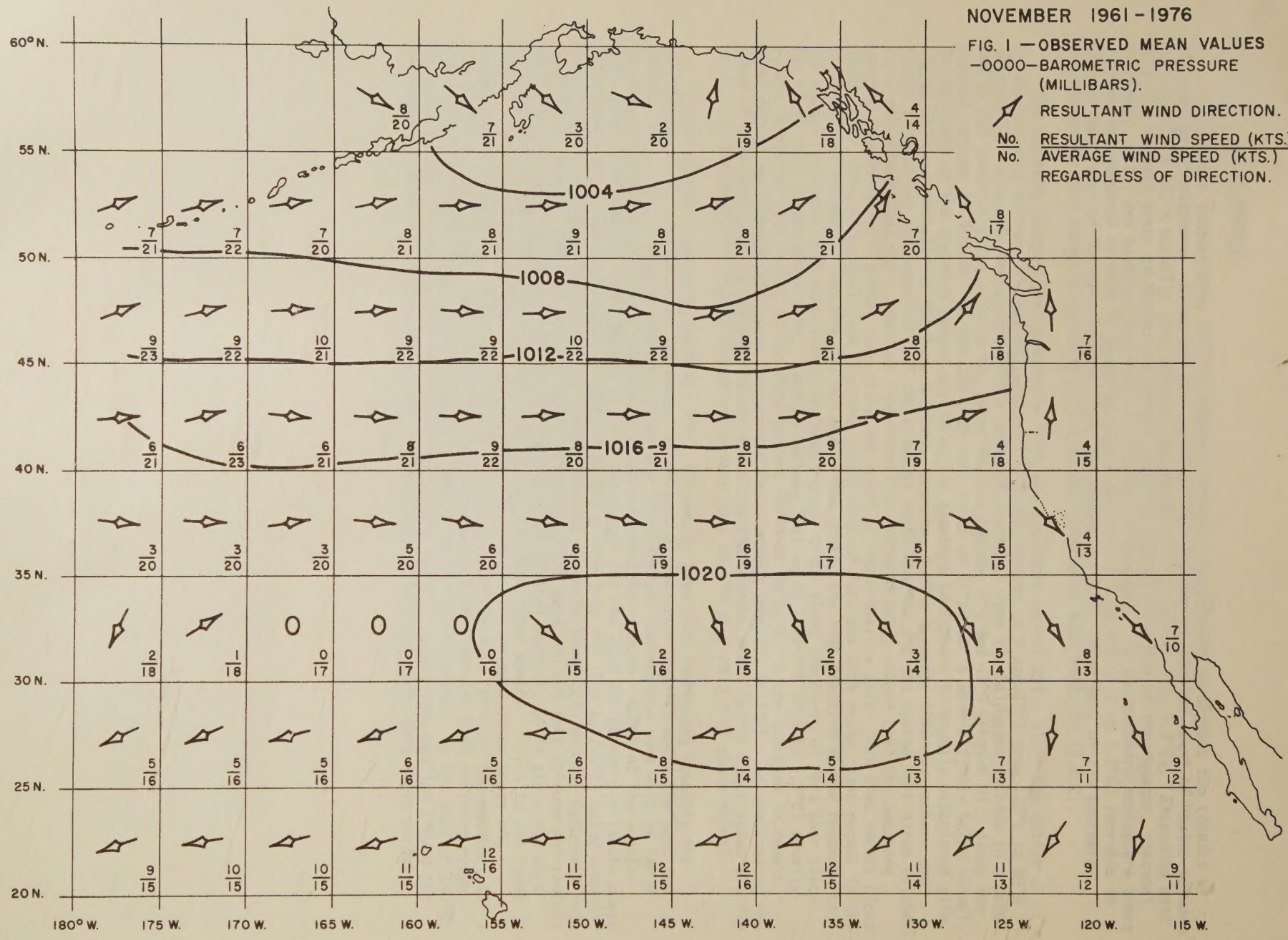
Eastern Tropical Pacific

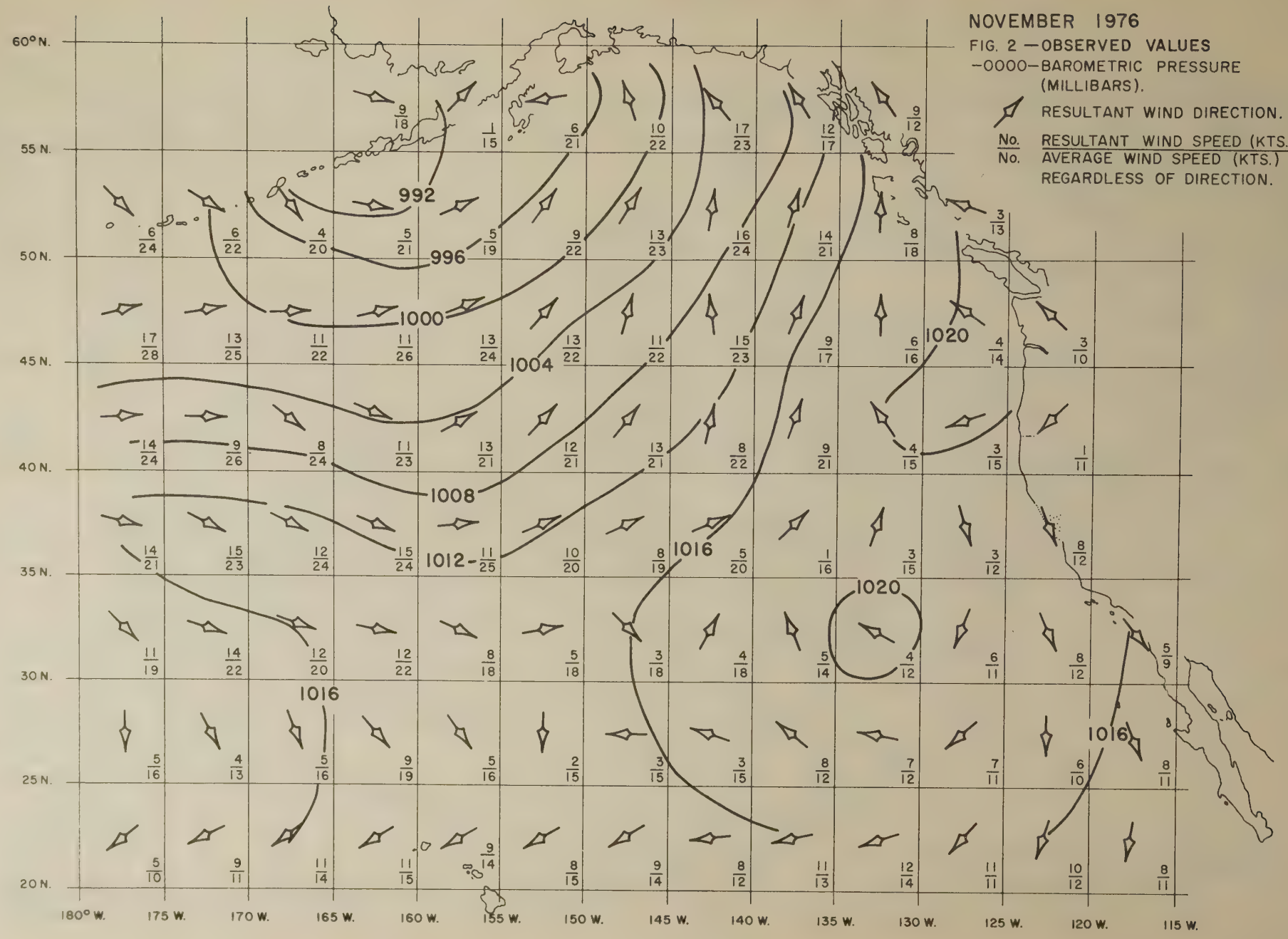
Sea surface temperatures (SST's) normally decrease in November throughout the tropics in the northern hemisphere. Along the west coast of Baja California and the coast of Mexico between 10°N and 30°N SST's normally show seasonal decreases of 2 to 3°F (1.1 to 1.7°C). Extending west from the coastal areas of Mexico and Central America and to the north of the equator, seasonal decreases in SST are usually less than 1°F (0.6°C) in November. In the southern hemisphere there is a normal seasonal warming in November with a maximum of 2 to 3°F (1.1 to 1.7°C) increase in the surface layer of the Peru Current from the equator to 25°S. Over most of the southern hemisphere to 30°S there is normally only a slight warming of less than 1°F (0.6°C).

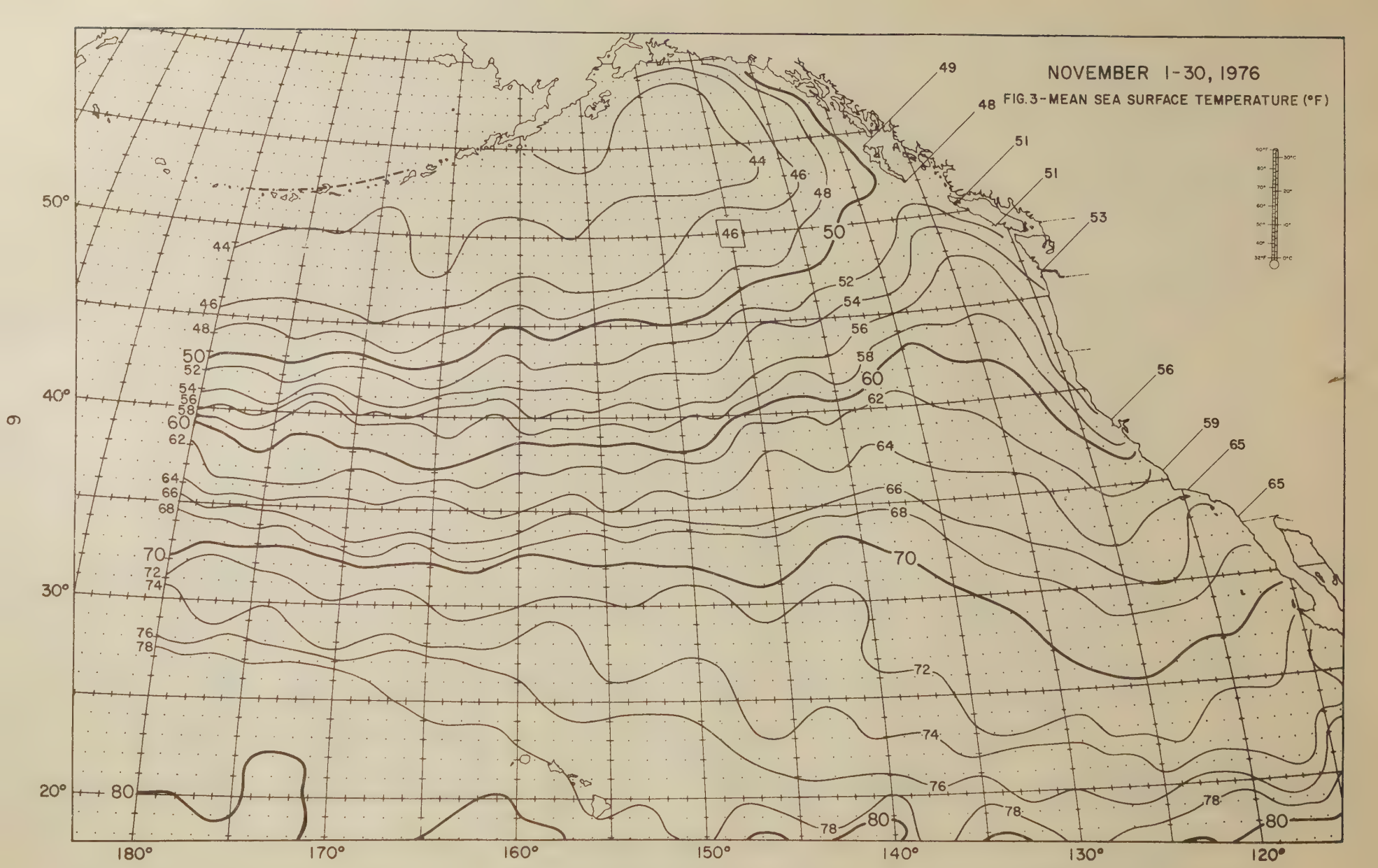
The dominant feature during November 1976 was the above normal SST's along the entire equatorial area between 5°N and 5°S west of 130°W and between 10°N and 10°S from 130°W to 90°W (Figure 9). Also, the above normal SST's extended southeast from the Galápagos Islands in a band 400 to 500 nautical miles wide to the coast of Peru between 8°S and 13°S (Figure 9). Along the coastal regions of Ecuador and the coast of Peru south of 15°S, SST's were slightly below normal. The approach of the southern summer season in the southern hemisphere is usually associated with rising SST's, especially in the Peru Current. However, during November 1976 the pattern and extent of positive SST anomalies off the coast of South America did not change much since October. Cloud photographs and SST's, derived from satellite infrared data, showed that the seasonal warming progressed at a normal rate along the coast of South America under less than normal cloud conditions. The subtropical high pressure center west of Peru was much weaker than normal in the first half of November. However, by the end of the month, the high pressure center returned to its normal intensity with more steady southeast trade winds along the coast of Peru than since the first half of September 1976. Because surface heating of 1 to 2°F (0.6 to 1.1°C) usually occurs in the surface layers of the Peru Current north of 30°S, SST's are expected to remain above normal in December 1976 over much of the Peru Current from 5°S to 15°S. In areas along the coast of Peru more than 100 miles offshore and along the equator where fairly clear skies usually prevail in December, SST's will probably increase to 4 to 6°F (2.2 to 3.3°C) above normal.

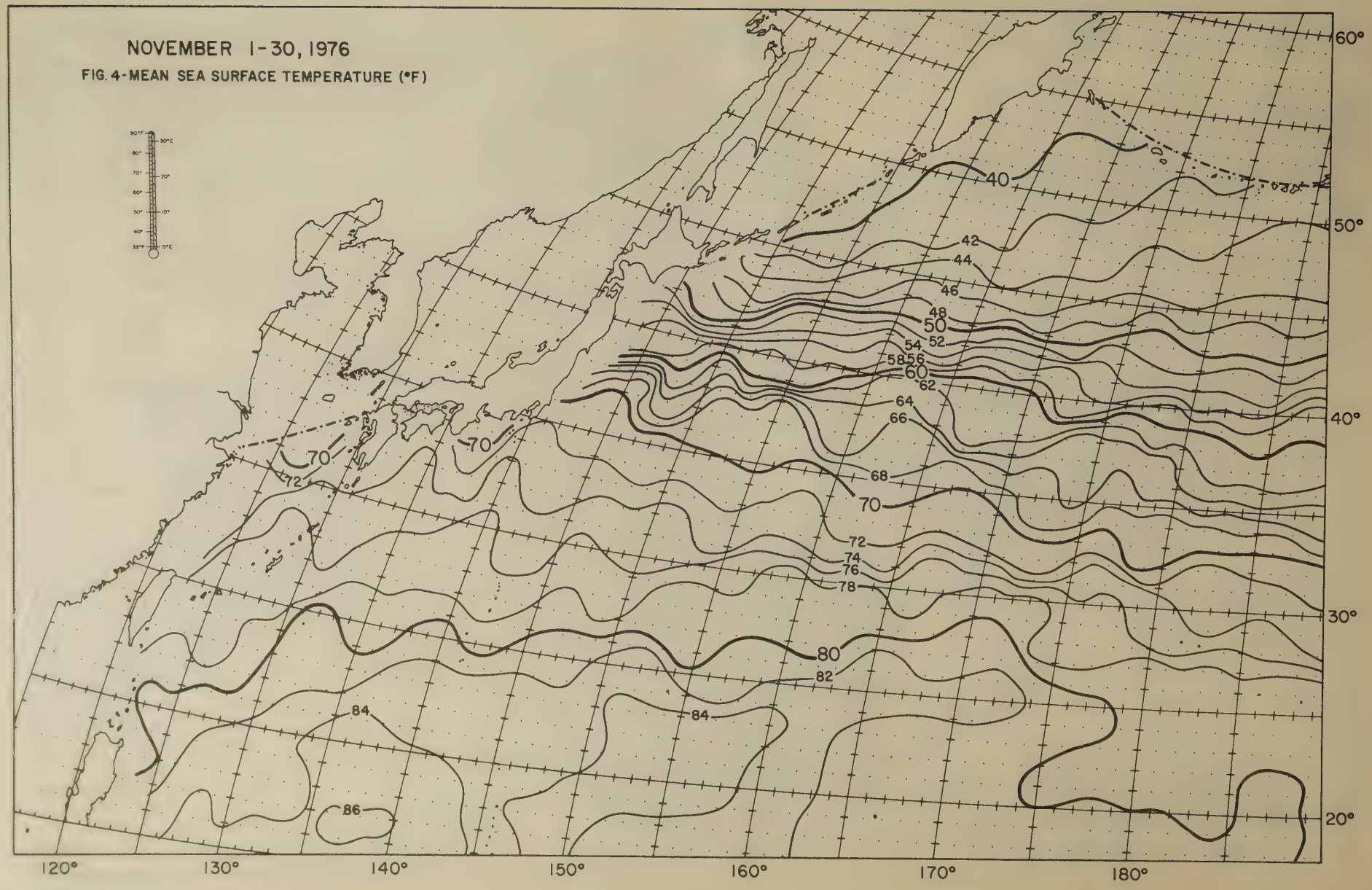
In the central equatorial Pacific, SST's (Figure 8) have been increasing steadily for several months and the positive SST anomalies (Figure 9) increased significantly the past two months. As a result, weather activity along the intertropical convergence zone west of 140°W increased and upwelling of cold subsurface water was markedly reduced. North of the equator SST's were significantly below normal in only two areas. In the Gulf of Tehuantepec (south coast of Mexico) and off the west coast of Costa Rica SST's were 2 to 4°F (1.1 to 2.2°C) below normal, as a result of frequent and persistent northerly winds which followed cold weather outbreaks into the Gulf of Mexico. These strong northerly winds mixed the water to 150 feet or more and rapidly cooled SST's. In contrast to the coastal cooling along Central America, SST's along the west coast of Baja California have been above normal for the past three months. SST's in the local (Baja California) fishing grounds south of 30°N were 6°F (3.3°C) or more above those of November 1975 (Figure 7). Over the remainder of the tropical Pacific north of the equator, SST's were slightly above normal east of 140°W in association with an extensive high pressure ridge, clear skies and light winds, which extended northward to British Columbia. To the west of 140°W, the Aleutian low pressure system over the north central Pacific caused some cooling around the Hawaiian Islands and to the southwest where surface winds and cloud cover were above normal.

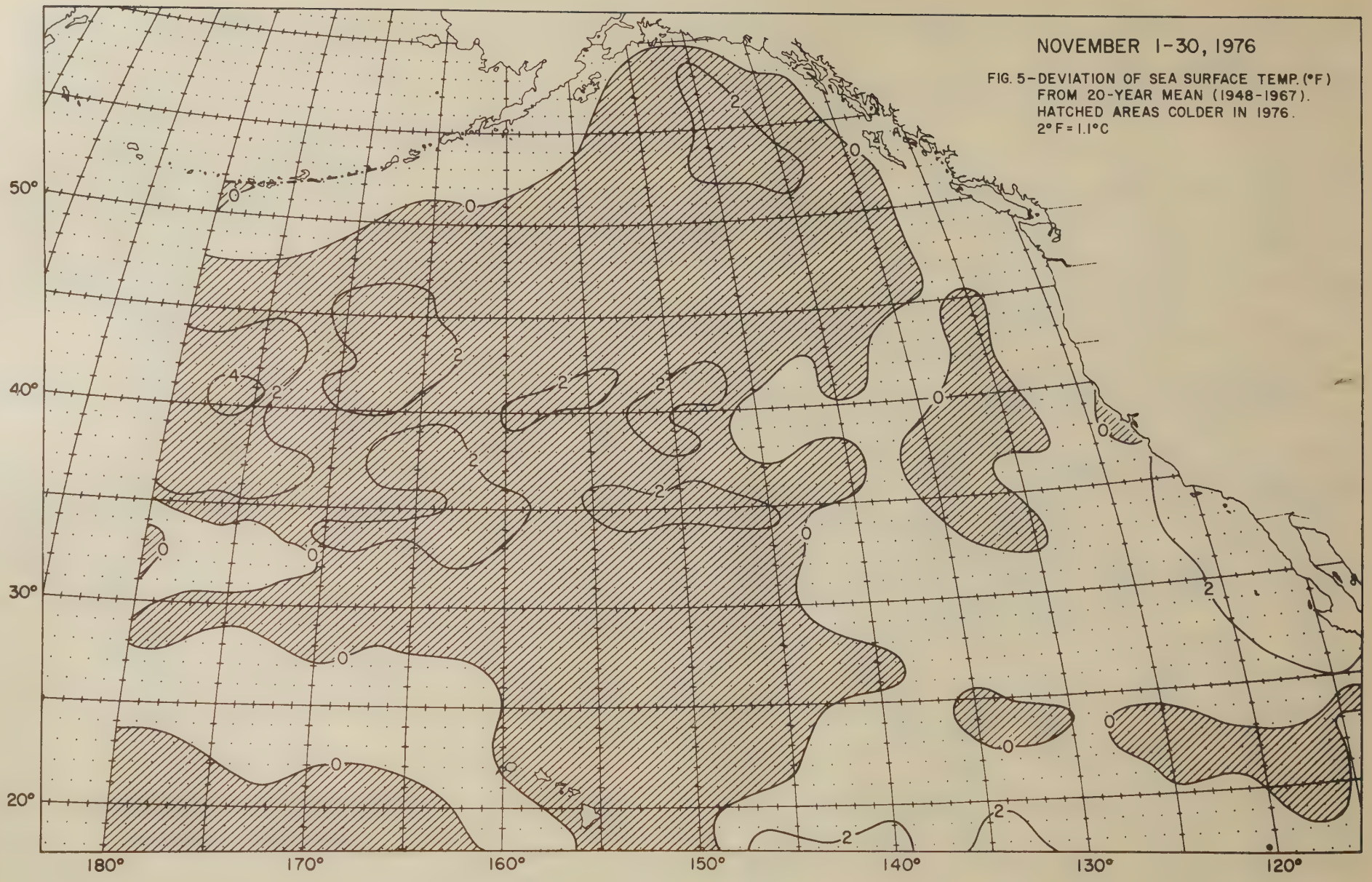


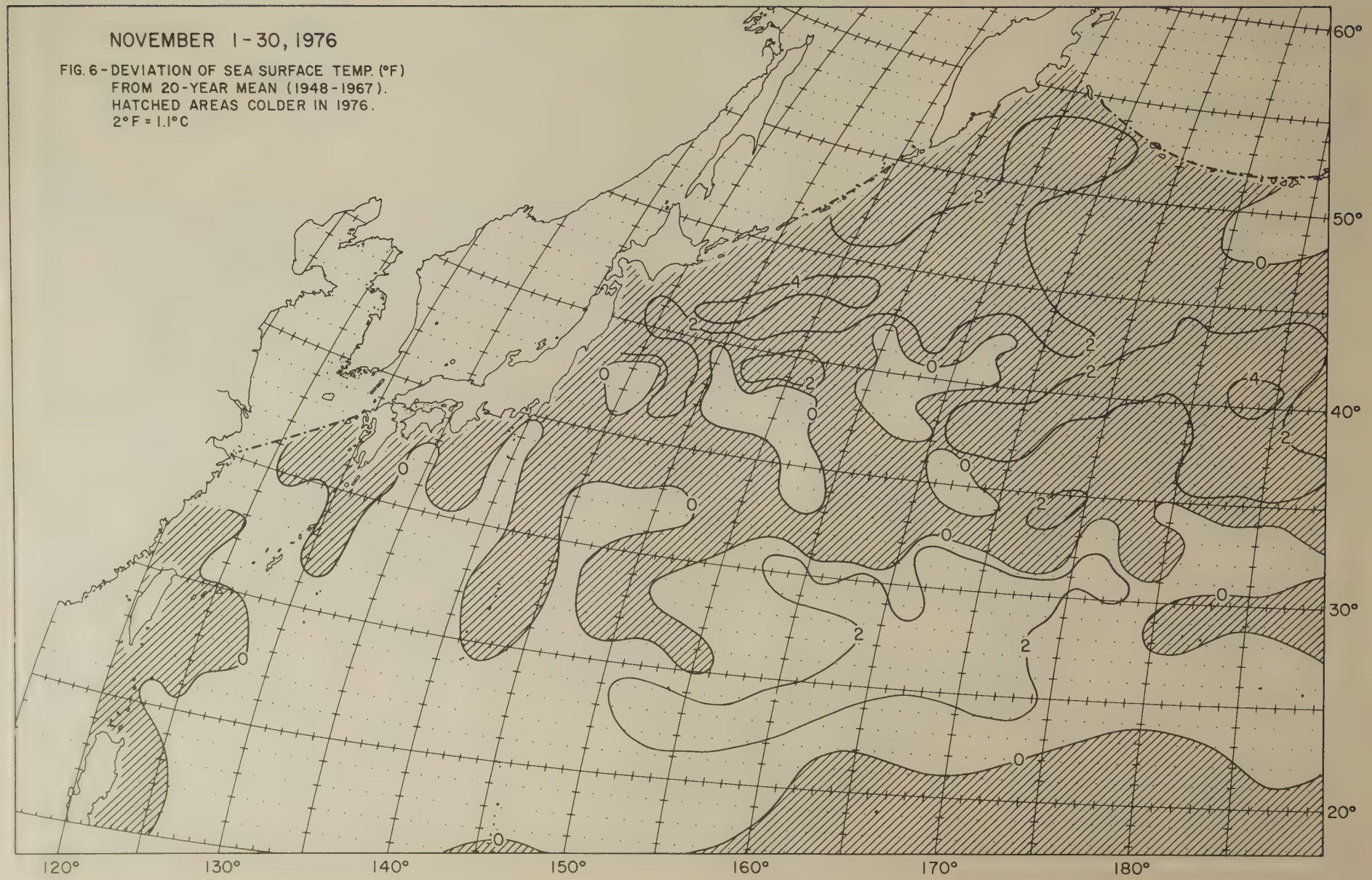

NOVEMBER 1961 - 1976
FIG. 1 — OBSERVED MEAN VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. / No. RESULTANT WIND SPEED (KTS.) / AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1004
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

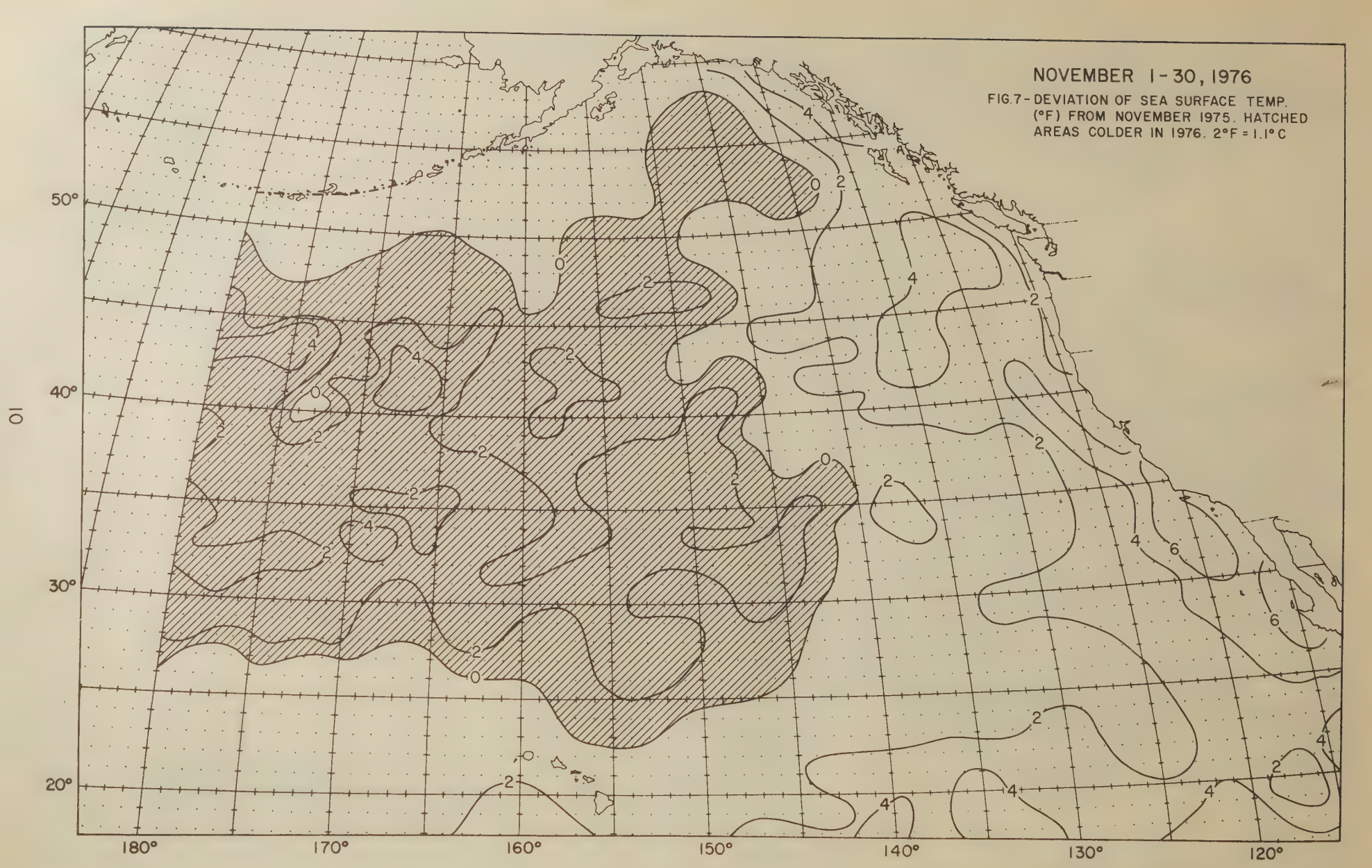

NOVEMBER 1976
FIG. 2 — OBSERVED VALUES
-0000- BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. / No. RESULTANT WIND SPEED (KTS.) / AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.
992
996
1000
1004
1008
1012
1016
1020

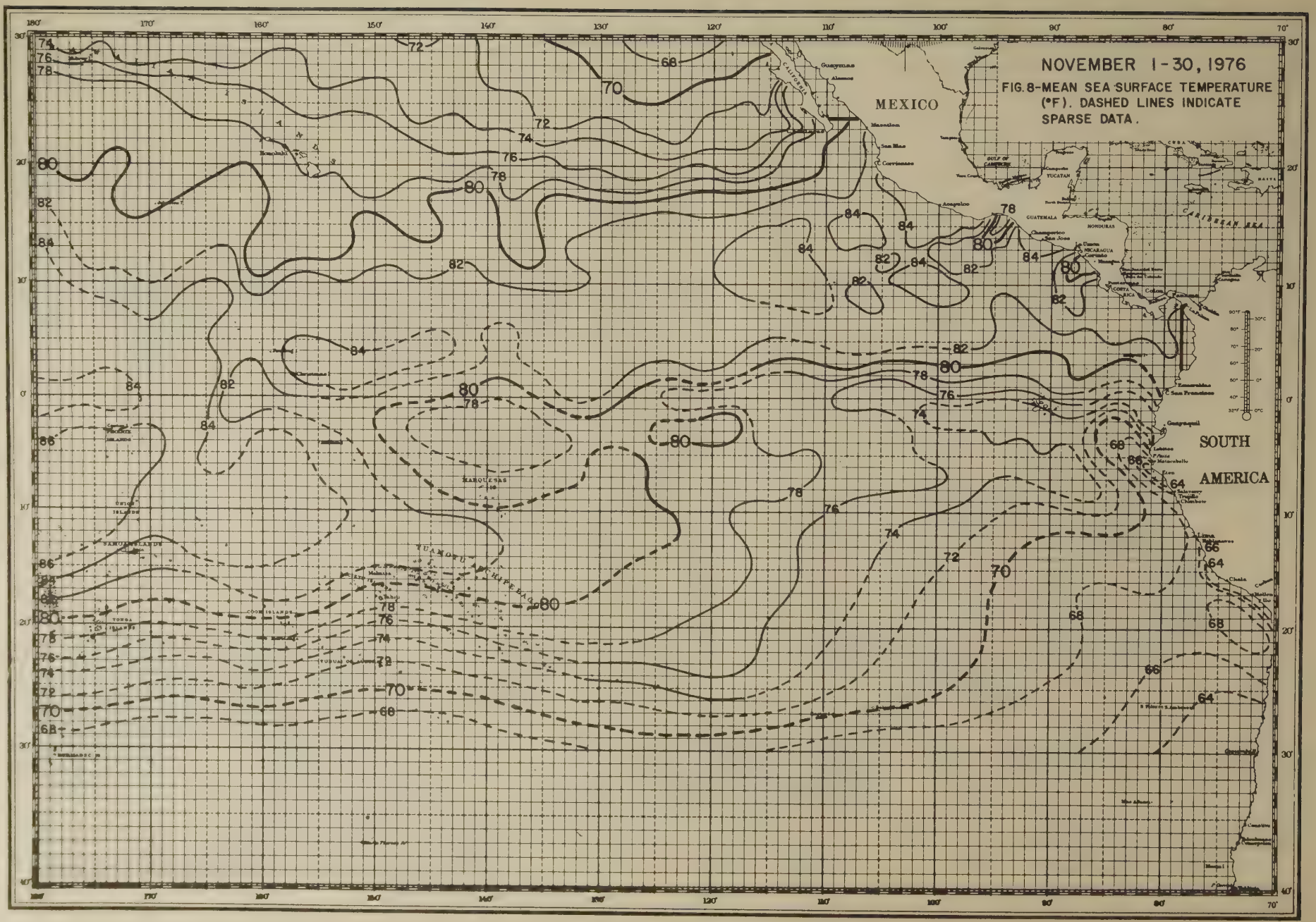

NOVEMBER 1-30, 1976
FIG.3-MEAN SEA SURFACE TEMPERATURE (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


NOVEMBER 1-30, 1976
FIG. 4-MEAN SEA SURFACE TEMPERATURE (°F)
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°
40
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
84
86


NOVEMBER 1-30, 1976
FIG. 5-DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20-YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1976. 2° F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


NOVEMBER 1-30, 1976
FIG. 6 - DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20-YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1976. 2°F = 1.1°C
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°
0
2
4


NOVEMBER 1-30, 1976
FIG.7-DEVIATION OF SEA SURFACE TEMP. (°F) FROM NOVEMBER 1975. HATCHED AREAS COLDER IN 1976. 2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


NOVEMBER 1-30, 1976
FIG. 8-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CALIFORNIA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
CARIBBEAN SEA
MARQUESAS
SAMOA ISLANDS
TONGA ISLANDS
TUAMOTU ARCHIPELAGO
TUBUAI Islands
Guayaquil
Lima
Chala

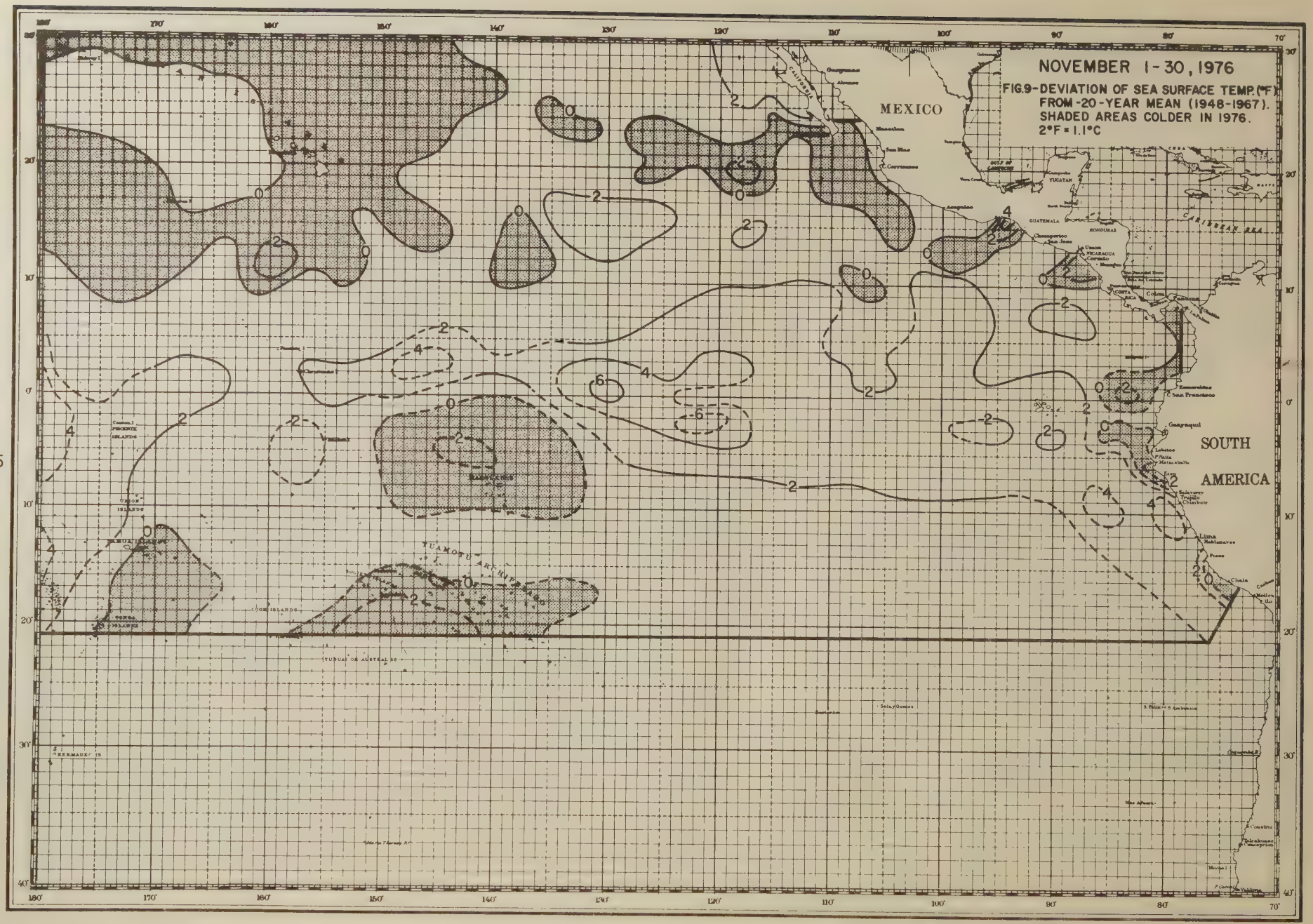

NOVEMBER 1-30, 1976
FIG.9-DEVIATION OF SEA SURFACE TEMP.(°F) FROM 20-YEAR MEAN (1948-1967). SHADED AREAS COLDER IN 1976. 2°F = 1.1°C
MEXICO
SOUTH AMERICA
CARIBBEAN AREA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
YUCATAN
CUBA
HAITI
JAMAICA
Guayaquil
Lima
Chile
Callao
San Francisco
Salaverry
Trujillo
Chimbote
Paita
Talara
Lobitos
Matacaballo
Pisco
Mollendo
Arica
Iquique
Antofagasta
Coquimbo
Valparaiso
Concepción
Talcahuano
Corral
Puerto Montt
Ancud
Punta Arenas
Guaymas
Mazatlan
San Blas
Acapulco
Salina Cruz
Tehuantepec
Puerto Cortes
Puntarenas
Colon
Cristobal
Maracaibo
Caracas
Barranquilla
Cartagena
Santa Marta
Curacao
Aruba
Trinidad
Tobago
Barbados
Martinique
Guadeloupe
Antigua
Puerto Rico
Virgin Islands
Bermuda
Bahamas
Florida
Key West
Miami
Havana
Nassau
Galveston
New Orleans
Tampico
Veracruz
Progreso
Belize
Merida
Campeche
Coatzacoalcos
Minatitlan
Salina Cruz
Acapulco
Manzanillo
Guaymas
Mazatlan
San Blas
Corinto
Managua
Puerto Limon
Bluefields
Port Antonio
Kingston
Montego Bay
Port-au-Prince
Cap Haitien
Santiago
Santo Domingo
Ponce
San Juan
Fort-de-France
Castries
Bridgetown
Port of Spain
Georgetown
Paramaribo
Cayenne
Belem
Fortaleza
Natal
Recife
Salvador
Rio de Janeiro
Santos
Montevideo
Buenos Aires
Mar del Plata
Bahia Blanca
Comodoro Rivadavia
Puerto Deseado
Puerto Santa Cruz
Rio Gallegos
Ushuaia
Cape Horn
Falkland Islands
Stanley
South Georgia
Tristan da Cunha
Gough Island
Ascension
St. Helena
Walvis Bay
Luderitz
Cape Town
Port Elizabeth
East London
Durban
Lourenco Marques
Beira
Mozambique
Dar es Salaam
Mombasa
Zanzibar
Aden
Muscat
Karachi
Bombay
Goa
Madras
Colombo
Calcutta
Rangoon
Singapore
Penang
Medan
Jakarta
Surabaya
Bali
Timor
Darwin
Perth
Fremantle
Albany
Adelaide
Melbourne
Sydney
Brisbane
Townsville
Cairns
Port Moresby
Rabaul
Manila
Hong Kong
Shanghai
Tsingtao
Dairen
Vladivostok
Yokohama
Kobe
Nagasaki
Naha
Okinawa
Taipei
Keelung
Guam
Saipan
Truk
Ponape
Kwajalein
Majuro
Eniwetok
Wake Island
Midway Islands
Honolulu
Hilo
Kahului
Nawiliwili
Kodiak
Juneau
Ketchikan
Sitka
Seward
Anchorage
Nome
Barrow
Point Barrow
Prudhoe Bay
Kotzebue
Unalaska
Dutch Harbor
Adak
Attu
Shemya
Kiska
Amchitka
Petropavlovsk
Magadan
Okhotsk
Nikolayevsk
Sakhalin
Hokkaido
Honshu
Shikoku
Kyushu
Okinawa
Taiwan
Hainan
Vietnam
Thailand
Malaya
Sumatra
Java
Borneo
Celebes
New Guinea
Australia
New Zealand
Fiji
Tonga
Samoa
Cook Islands
Society Islands
Tuamotu Archipelago
Marquesas
Easter Island
Pitcairn Island
Galapagos
Clipperton
Revillagigedo
Hawaiian Islands
Midway
Wake
Marshall Islands
Caroline Islands
Marianas
Palau
Yap
Truk
Ponape
Kwajalein
Majuro
Eniwetok
Gilbert Islands
Ellice Islands
Phoenix Islands
Union Islands
Tokelau Islands
Samoa
Tonga
Fiji
New Caledonia
Loyalty Islands
New Hebrides
Solomon Islands
Bismarck Archipelago
New Britain
New Ireland
Admiralty Islands
Manus
Rabaul
Port Moresby
Papua
New Guinea
Torres Strait
Cape York
Gulf of Carpentaria
Arnhem Land
Darwin
Timor
Arafura Sea
Banda Sea
Ceram
Halmahera
Celebes
Sulawesi
Makassar Strait
Java Sea
Java
Sumatra
Indian Ocean
Bay of Bengal
Andaman Islands
Nicobar Islands
Malacca Strait
Malaya
Singapore
Gulf of Thailand
Thailand
Vietnam
Hainan
South China Sea
Philippines
Luzon
Manila
Mindoro
Mindanao
Sulu Sea
Celebes Sea
Molucca Sea
Halmahera
New Guinea
Bismarck Sea
Solomon Sea
Coral Sea
Great Barrier Reef
Queensland
Brisbane
Sydney
Tasman Sea
New Zealand
North Island
South Island
Cook Strait
Wellington
Auckland
Christchurch
Dunedin
Bluff
Stewart Island
Foveaux Strait
Campbell Island
Auckland Islands
Macquarie Island
Antarctic Ocean
Ross Sea
Ross Ice Shelf
Victoria Land
Scott Base
McMurdo Sound
Mount Erebus
Mount Terror
Balleny Islands
Peter I Island
Thurston Island
Eights Coast
Ellsworth Land
Weddell Sea
Filchner Ice Shelf
Coats Land
Queen Maud Land
Enderby Land
Kemp Land
Davis Sea
Mawson
Commonwealth Bay
George V Land
Adelie Land
Terre Adelie
Dumont d'Urville
Macquarie Island
Balleny Islands
Scott Island
Ross Sea
Ross Ice Shelf
Victoria Land
Scott Base
McMurdo Sound
Mount Erebus
Mount Terror
Balleny Islands
Peter I Island
Thurston Island
Eights Coast
Ellsworth Land
Weddell Sea
Filchner Ice Shelf
Coats Land
Queen Maud Land
Enderby Land
Kemp Land
Davis Sea
Mawson
Commonwealth Bay
George V Land
Adelie Land
Terre Adelie
Dumont d'Urville

FIGURE 10

SHIP HAWAIIAN QUEEN

VOYAGE 192

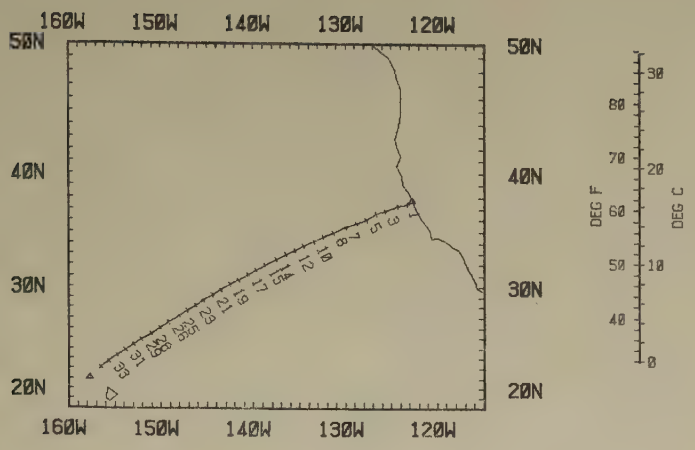
MATSON

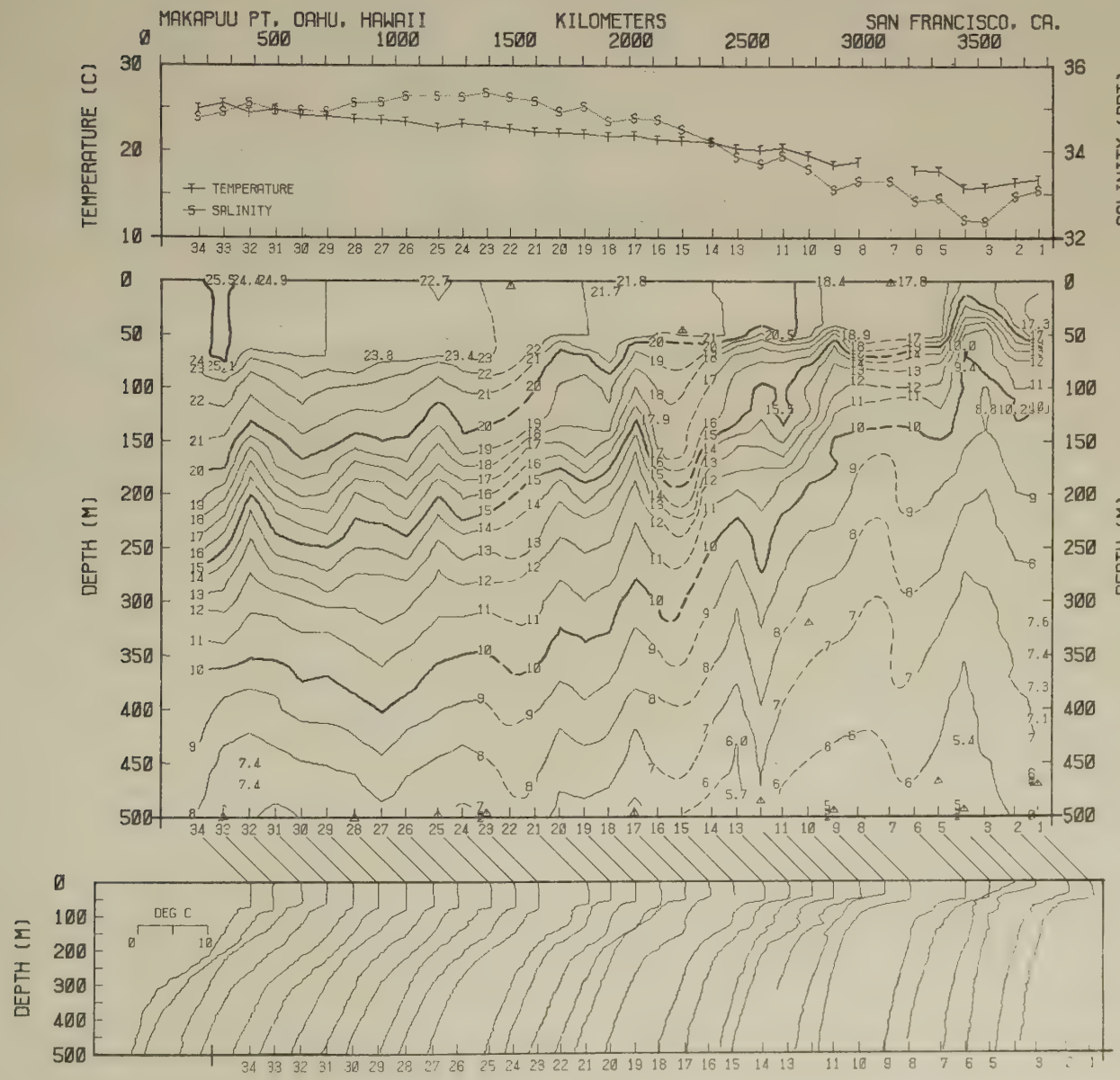
SAN FRANCISCO, CA.

- MAKAPUU PT, OAHU, HAWAII

04 NOV 1976 - 10 NOV 1976

NOAA-NMFS PEG MONTEREY, CA.





UNITED STATES
DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES CENTER
8604 LA JOLLA SHORES DRIVE
P.O. BOX 271
LA JOLLA, CALIFORNIA 92038

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300
11ND-COM-2700/1 (REV. 6-75)

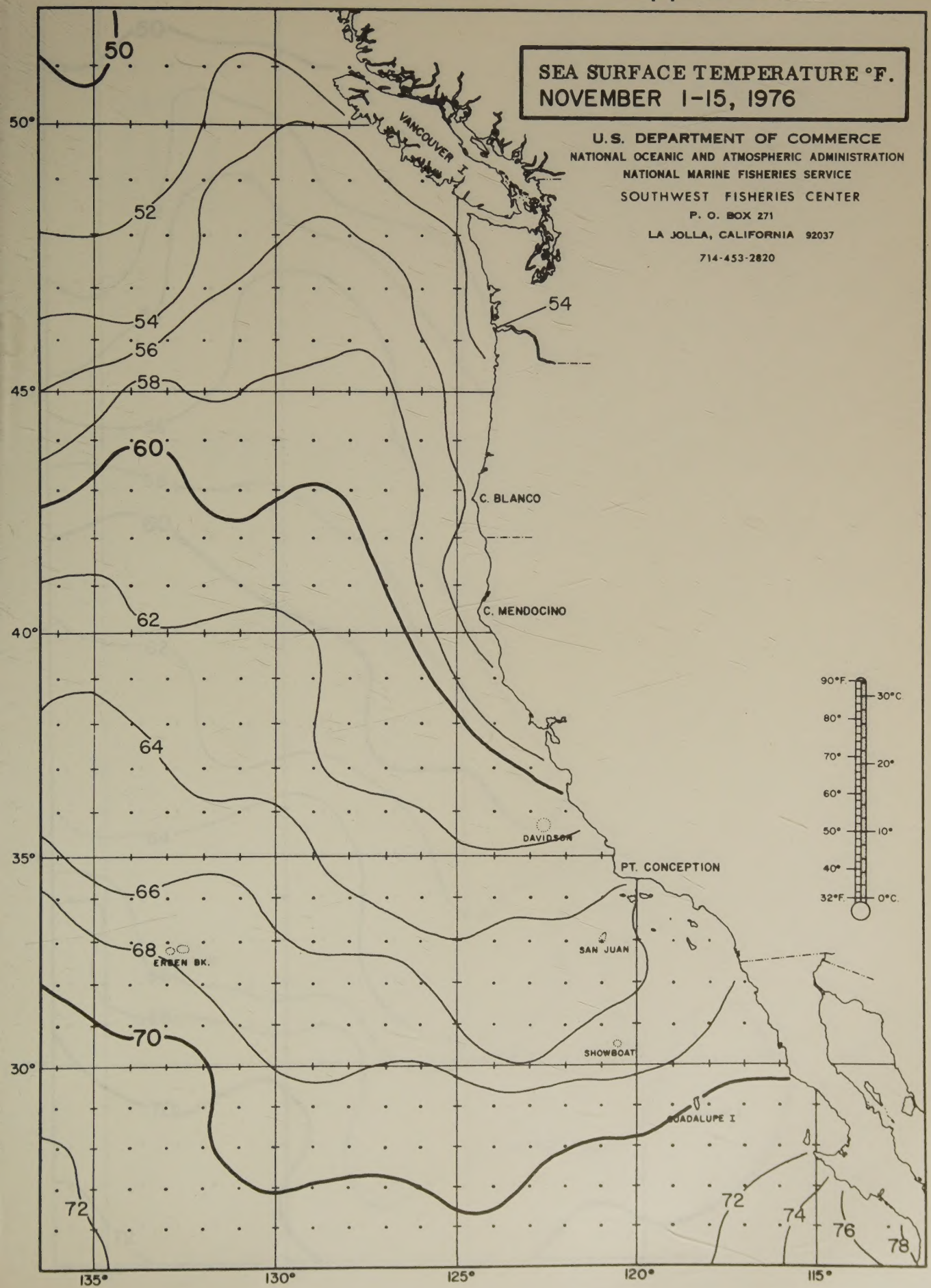
AN EQUAL OPPORTUNITY EMPLOYER

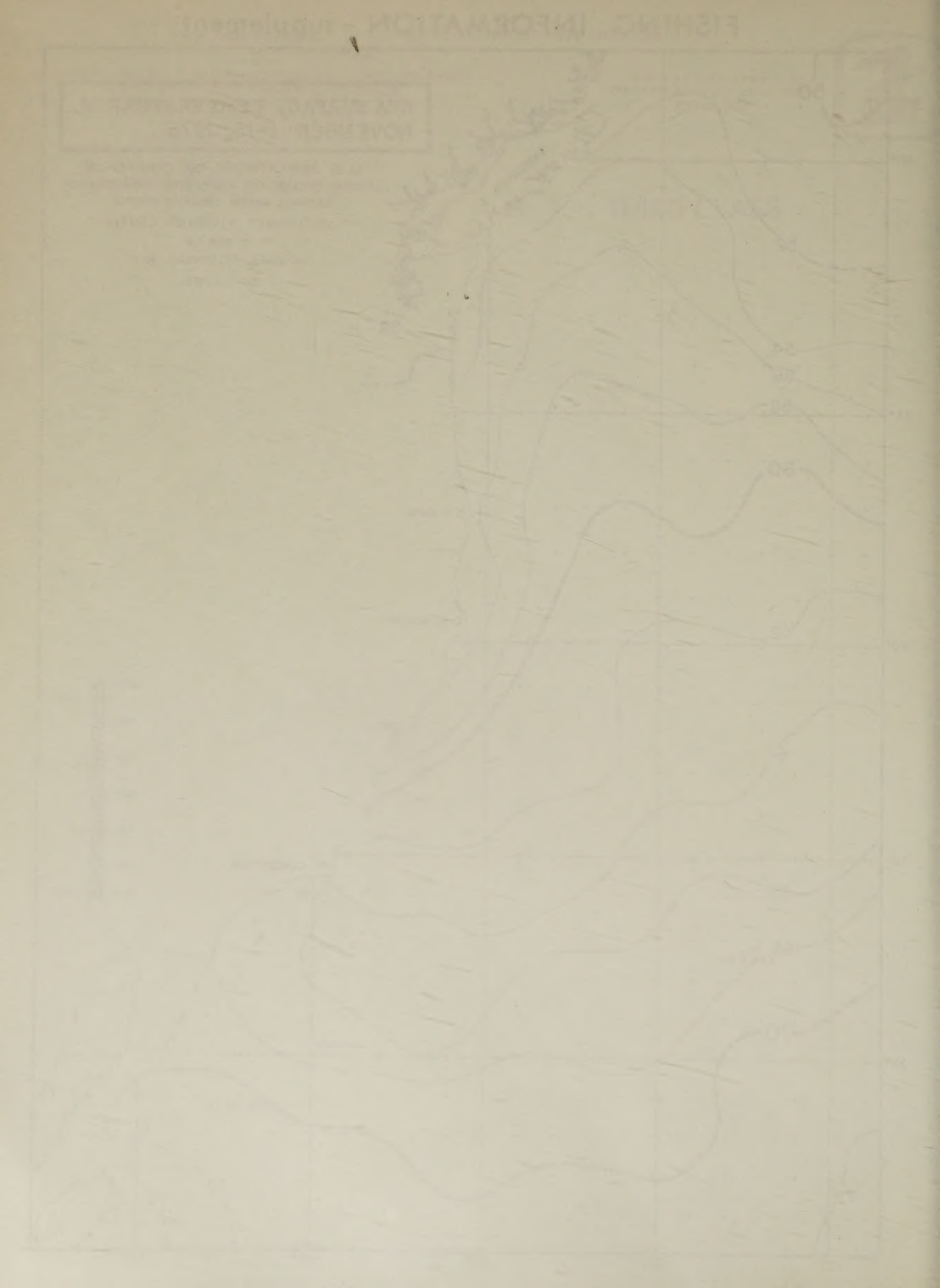
POSTAGE AND FEES PAID
DEPARTMENT OF COMMERCE
COM-210

U.S.MAIL

THIRD CLASS

FISHING INFORMATION – supplement





FISHING INFORMATION – supplement